

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

To:

AWAPATENT AB
P.O. Box 11394
S-404 28 Göteborg
SUÈDE

NOTIFICATION OF THE RECORDING
OF A CHANGE

(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 18 April 2000 (18.04.00)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference M 1977-1 WO	
International application No. PCT/SE99/01259	International filing date (day/month/year) 12 July 1999 (12.07.99)

1. The following indications appeared on record concerning:

☐ the applicant ☐ the inventor ☒ the agent ☐ the common representative

Name and Address

ASTRAZENECA AB
Intellectual Property, Patents
S-151 85 Södertälje
Sweden

State of Nationality

State of Residence

Telephone No.

46 8 553 260 00

Facsimile No.

46 8 553 288 20

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☒ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address

AWAPATENT AB
P.O. Box 11394
S-404 28 Göteborg
Sweden

State of Nationality

State of Residence

Telephone No.

46 31 63 02 00

Facsimile No.

46 31 63 02 63

Teleprinter No.

3. Further observations, if necessary:

The indication of a new address of the agent on the demand (Form PCT/IPEA/401) has been considered a request for recording a change under Rule 92bis. In case of disagreement, the International Bureau should be notified immediately.

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned
☐ the International Searching Authority ☒ the elected Offices concerned
☒ the International Preliminary Examining Authority ☒ other: Former agent

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

F. Baechler

Telephone No.: (41-22) 338.83.38

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) M 1977-1 WO

Box No. I TITLE OF INVENTION	
A MOUNTING APPARATUS	
Box No. II APPLICANT	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
ASTRA AKTIEBOLAG S-151 85 Södertälje Sweden	
<input type="checkbox"/> This person is also inventor.	
Telephone No. +46 8 553 260 00	
Facsimile No. +46 8 553 288 20	
Teleprinter No.	
State (that is, country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
HORPPU, Petri Astra Tech AB P.O. Box 14 S-431 21 Mölndal Sweden	
This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)	
State (that is, country) of nationality: SE	State (that is, country) of residence: SE
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
Intellectual Property, Patents Astra Aktiebolag S-151 85 Södertälje Sweden	
Telephone No. +46 8 553 260 00	
Facsimile No. +46 8 553 288 20	
Teleprinter No.	
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

AMRÉN, Birger
Oskarsgatan 4
S-439 33 Onsala
Sweden

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:
SE

State (that is, country) of residence:
SE

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

DVÄRSÄTER, Gudmund
Astra Tech AB
P.O. Box 14
S-431 21 Mölndal
Sweden

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:
SE

State (that is, country) of residence:
SE

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line).

- | | |
|---|---|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AT Austria and utility model | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> CZ Czech Republic and utility model | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DE Germany and utility model | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DK Denmark and utility model | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> EE Estonia and utility model | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> FI Finland and utility model | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SK Slovakia and utility model |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> ZA South Africa |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | |
| <input checked="" type="checkbox"/> LC Saint Lucia | |
| <input checked="" type="checkbox"/> LK Sri Lanka | |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

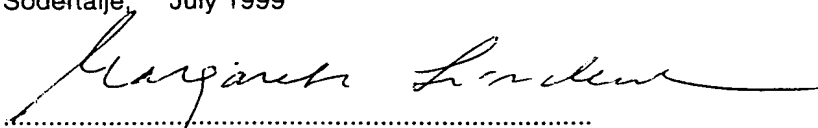
Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 15 July 1998	9802553-9	Sweden		
item (2) 31 May 1999	9901998-6	Sweden		
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): (1) and (2)

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY			
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / SE		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority): Date (day/month/year) Number Country (or regional Office)	

Box No. VIII CHECK LIST; LANGUAGE OF FILING	
This international application contains the following number of sheets: request : 4 description (excluding sequence listing part) : 14 claims : 4 abstract : 1 drawings : 6 sequence listing part of description : Total number of sheets : 29	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input checked="" type="checkbox"/> copy of general power of attorney; reference number, if any: GF 4353/98 and GF 1103/99 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):
Figure of the drawings which should accompany the abstract: 13	Language of filing of the international application: English

Box No. IX SIGNATURE OF APPLICANT OR AGENT	
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).	
Södertälje, July 1999  Margareta Linderöth Intellectual Property, Patents, Astra Aktiebolag	

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only
Date of receipt of the record copy by the International Bureau:

09/380519

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

15
REC'D 30 OCT 2000

PCT

Applicant's or agent's file reference PC-2402298	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE99/01259	International filing date (day/month/year) 12.07.1999	Priority date (day/month/year) 15.07.1998
International Patent Classification (IPC) or national classification and IPC ₇ A61B 17/12		
Applicant AstraZeneca AB et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 02.02.2000	Date of completion of this report 18.10.2000
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Anette Hall/MP Telephone No. 08-782 25 00

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/01259

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☐ the international application as originally filed.

☒ the description, pages 1-14, as originally filed,
 pages _____, filed with the demand,
 pages _____, filed with the letter of _____,
 pages _____, filed with the letter of _____.

☒ the claims, Nos. _____, as originally filed,
 Nos. _____, as amended under Article 19,
 Nos. _____, filed with the demand,
 Nos. 1-21, filed with the letter of 30.08.2000,
 Nos. _____, filed with the letter of _____.

☒ the drawings, sheets/fig 1-23, as originally filed,
 sheets/fig _____, filed with the demand
 sheets/fig _____, filed with the letter of _____,
 sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/01259

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☐ claims Nos. 15, 16

because:

☐ the said international application, or the said claims Nos. _____

relate to the following subject matter which does not require an international preliminary examination (*specify*):

Claim 15:

The features "A surgical kit comprising a mounting apparatus as claimed in any one of claims 1 to 14" are too general and elusive and have been searched incompletely.

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 15 and 16
are so unclear that no meaningful opinion could be formed (*specify*):

Claim 16:

The features "A surgical kit as claimed in claim 15 including a surgical instrument for ligating internal body tissue" are too general and elusive and have been searched incompletely.

☒ the claims, or said claims Nos. 15 and 16 are so inadequately supported
by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. _____

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/01259

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
☐ paid additional fees.
☐ paid additional fees under protest.
☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
☒ not complied with for the following reasons:

2.

This application contains the following inventions or group of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1.

- a) Claims 1-9, 14, 17-18, 20 and 21: a surgical ring clip loader provided with arms.
b) Claims 1, 10-13 and 19: a surgical ring clip loader provided with hooks.
c) Claims 15-16: a surgical kit comprising a surgical ring clip loader.

In the light of US, 4 493 319, A; US, 4 860 746, A; US, 4 548 201, A or DE, 9205453, U1 the subject matter of claim 1 lacks novelty.

Since the common concept represented by claim 1 is not new and there cannot be found a technical relationship involving corresponding special technical features, under Rule 13.2, between the subject-matter of claims 1-21, i.e. inventions a) to c), these inventions, are not linked together by a single common inventive concept.

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
☐ the parts relating to claims Nos. _____

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/01259

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-9, 13, 19, 20</u>	YES
	Claims	<u>14-18, 21</u>	NO
Inventive step (IS)	Claims	<u>10-13, 19</u>	YES
	Claims	<u>1-9, 14-18, 20, 21</u>	NO
Industrial applicability (IA)	Claims	<u>1-21</u>	YES
	Claims		NO

2. Citations and explanations

The claimed invention according to the amended claims of Aug.30, 2000 relates to devices, a kit and methods for mounting an expandable endless band on a surgical instrument. The device comprises a tapered band dilator for loading elastic bands onto the distal end of the instrument. The instrument according to claim 1 is characterised in that the arms of the dilator are tapering in a radial direction towards the centre.

Document DE, 9205453, U1 discloses a surgical band clip dilator and loaders. The dilator is tapered and adapted to dilate the band while it is pushed with the loader along the loader and place the dilated bands on an distal end of an applicator. The loader comprises space-apart fingers. The dilator comprises space-apart arms adapted to co-operate with the fingers.

The invention according to claim 1 differs in that the arms of the dilator are not tapering in a radial direction.

However, documents US, 4548201, A; US, 4794927, A, US, 4860746, A and US, 4493319, A disclose loaders with tapering arms in a radial extension. With the knowledge of one of these loaders and the device known from DE, 9205453, U1 it appears obvious to one skilled in the art to construct an apparatus according to claims 1-4.

The DE, 9205453, U1 further discloses the details according to claims 5-8.

Documents US, 4548201, A; US, 4794927, A, US, 4860746, A and US, 4493319, A further disclose the details according to claims 9 and 20.

.../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/01259

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V.

Consequently, the subject matter of claims 1-9 and 20 lacks inventive step.

Each of the documents also discloses a method identical to the one described in claims 17, 18 and 21.

Each of the documents seems to disclose an apparatus and a kit as described in claims 14-16.

Consequently, the subject matter of claims 14-16 lacks novelty and inventive step.

However, the claimed invention described in claims 1-21 fulfils the requirement of industrial applicability.

None of the documents disclose a device as described in claims 10-13 and a method as described in claim 19. Claims 10-13 and 19 consequently fulfil the requirements of novelty and inventive step.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/01259

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 2, 3, 10, 14 and 16, and consequently the dependent claims, are not clear and concise since the invention is defined by results to be achieved (Article 6). Claims must be drafted in terms of the "technical features of the invention".

Claim 15, and consequently the dependent claim, is not clear and concise since the invention is defined only by reference to other claims.

Claim 20 and 21 are not clear and concise since the invention is defined by reference to figures.

Claim 17 does not disclose which features the invention adds to the prior art.

The kit according to claims 15 and 16 is not fully supported in the description (Article 6, Rule 5(v)).

CLAIMS

1. A mounting apparatus for mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1) of a structure having a transverse dimension greater than that of the cord when in the contracted condition, said apparatus comprising a tapered adaptor (14; 114) for the cord to be propelled over onto the end of the structure having a forward smaller end (16; 116) for location in the cord in its contracted condition and a rear larger end (18; 118) for juxtaposing with the end of the structure characterised in that said apparatus further comprises an expander device (24; 124; 224) movable relative to the adaptor to propel the cord over the adaptor onto the rear larger end thereof.
2. A mounting apparatus as claimed in claim 1, characterised in that the expander device (24) is operable in a first mode thereof to propel the cord (2) over the adaptor (14) on to the rear larger end (18) thereof and in a second mode thereof to propel the cord from the rear larger end onto the end (1) of the structure.
3. A mounting apparatus as claimed in claim 1 or claim 2, characterised in that the adaptor (14) and the expander device (24) are adapted to mesh with one another to propel the cord (2) over the adaptor to the rear larger end (18) thereof.
4. A mounting apparatus as claimed in claim 3, characterised in that the adaptor (14) comprises a plurality of circumferentially spaced-apart fingers (22) which extend from the rear larger end (18) towards the forward smaller end (16) and the expander device (24) comprises a plurality of circumferentially spaced-apart arms (26) insertable between the fingers of the adaptor.

5. A mounting apparatus as claimed in any one of claims 1 to 4, characterised in that the forward smaller end of the adaptor (14) is presented by a central member (16).

5 6. A mounting apparatus as claimed in claim 5 when appendant on claim 4, characterised in that the central member (16) and the fingers (22) of the adaptor (14) are connected to one another.

7. A mounting apparatus as claimed in claim 2 or any one of claims 3 to 6
10 when appendant on claim 2, characterised in that the expander device (24) includes a tubular section (28) adapted to slide over the adaptor (14) to propel the cord (2) from the rear larger end (18) thereof onto the end (1) of the structure.

8. A mounting apparatus as claimed in claim 1, characterised in that the
15 expander device is in the form of a hook device (124; 224) which comprises two opposed hooks (136; 236) dimensioned to engage the cord (2) when in its contracted condition, the hook device being adapted for the hooks to engage with the cord when in its contracted condition and to be displaced away from one another when the hook device is moved relative to the adaptor (114) to propel the
20 cord over the adaptor to the rear larger end (118) thereof.

9. A mounting apparatus as claimed in claim 8, characterised in that the hooks (136; 236) are located at the end of opposed arms (132; 232) made of a resilient material.

25

10. A mounting apparatus as claimed in claim 8 or 9, characterised in that the hook device (224) includes a crease (238) for enabling the hooks (236) to be brought close together for engagement with the cord (2) when in its contracted condition.

30

11. A mounting apparatus as claimed in claim 8, 9 or 10, characterised in that the adaptor (114) is provided with guide tracks for guiding the hooks (136; 236) when the hook device (124; 224) is moved relative to the adaptor to propel the cord (2) over the adaptor.

5

12. A mounting apparatus as claimed in any one of the preceding claims for mounting an elastic cord (2) onto an end of a surgical instrument for ligating internal body tissue.

10

13. A surgical kit comprising a mounting apparatus as claimed in any one of claims 1 to 12.

14. A surgical kit as claimed in claim 13 including a surgical instrument for ligating internal body tissue.

15

15. A method of mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1) of a structure having a transverse dimension greater than that of the cord in its contracted condition comprising the steps of providing a tapered adapter (14; 114) having a forward smaller end (16; 116) and a rear larger end (18; 118), propelling the cord over the tapered adaptor onto the rear larger end thereof by displacement of an expander device (24; 124; 224) relative to the adaptor and, when the rear larger end of the tapered adaptor is juxtaposed to the end of the structure, propelling the cord from the rear larger end of the adaptor onto the end of the structure.

25

16. A method as claimed in claim 15, characterised by displacing the expander device (124; 224) relative to the adaptor (114) to move the cord (2) over the adaptor onto the end (1) of the structure.

30

17. A method as claimed in claim 16, characterised by the provision of an

expander device in the form of a hook device (124; 224) comprising two hooks (136; 236) dimensioned to engage with the cord (2) when in its contracted condition, engaging the hooks with the cord when the cord is in its contracted condition, displacing the hook device relative to the adaptor (114) so as to propel
5 the cord over the adaptor onto the end (1) of the structure and disengaging the hooks from the cord.

18. A mounting apparatus for mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1)
10 of a structure having a transverse dimension greater than that of the cord when in the contracted condition substantially as herein described with reference to and illustrated by Figures 1 to 18 or Figures 1 to 4 and 19 to 23 of the accompanying drawings.

15 19. A method of mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1) of a structure having a transverse dimension greater than that of the cord in its contracted condition substantially as herein described with reference to and illustrated by Figures 1 to 18 or Figures 1 to 4 and 19 to 23 of the accompanying drawings.

20

2

PCT

09/380519 5000

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : A61B 17/12		A1	(11) International Publication Number: WO 00/03642
			(43) International Publication Date: 27 January 2000 (27.01.00)
(21) International Application Number: PCT/SE99/01259			(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 12 July 1999 (12.07.99)			
(30) Priority Data: 9802553-9 15 July 1998 (15.07.98) SE 9901998-6 31 May 1999 (31.05.99) SE			
(71) Applicant (for all designated States except US): ASTRA AKTIEBOLAG [SE/SE]; S-151 85 Södertälje (SE).			
(72) Inventors; and (75) Inventors/Applicants (for US only): HORPPU, Petri [SE/SE]; Astra Tech AB, P.O. Box 14, S-431 21 Mölndal (SE). AMRÉN, Birger [SE/SE]; Oskarsgatan 4, S-439 33 Onsala (SE). DVÄRSÄTER, Gudmund [SE/SE]; Astra Tech AB, P.O. Box 14, S-431 21 Mölndal (SE).			
(74) Agent: ASTRA AKTIEBOLAG; Intellectual Property, Patents, S-151 85 Södertälje (SE).			

Published

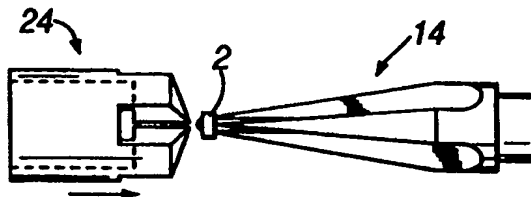
With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: ELASTIC SURGICAL RING CLIP/LOADER AND A METHOD

(57) Abstract

Mounting apparatus for mounting an end-less cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1) of a structure having a transverse dimension greater than that of the cord when in the contracted condition comprising a tapered adaptor (14; 114) for the cord to be propelled over onto the end of the structure having a forward smaller end (16; 116) for location in the cord in its contracted condition and a rear larger end (18; 118) for juxtaposing with the end of the structure and an expander device (24; 124; 224) movable relative to the adaptor to propel the cord over the adaptor onto the rear larger end thereof.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

ELASTIC SURGICAL RING CLIP/LOADER AND A METHOD

Field of the Invention

5 The present invention relates to a mounting apparatus for mounting an expandable endless cord or band such as an elastic cord or O-ring on an end of a structure which has a transverse dimension greater than that of the cord when in a contracted condition. The invention is particularly, although not exclusively, concerned with a mounting apparatus for mounting an elastic endless cord or
10 band on a surgical instrument for ligating internal tissues of a cavity in the human body by means of the elastic cord or band, one example being the ligation of haemorrhoids.

Background of the Invention

15 A surgical instrument for ligating haemorrhoids is disclosed in European patent EP 0310582 B1, the contents of which are incorporated herein by reference. This surgical instrument, which will be referred to herein as a "surgical instrument of the type defined", includes an inner front cylinder with the elastic cord stretched
20 around its front end and an outer discharge cylinder displaceably arranged on the inner front cylinder to push the elastic cord off the inner front cylinder to close around the stem of a haemorrhoid when inserted in the inner front cylinder.

In its normal rest or contracted condition the generally circular elastic cord is of
25 considerably smaller diameter than the external diameter of the inner front cylinder. The elastic cord is mounted on the inner front cylinder by means of a conical adaptor of circular cross-section having a larger rear end which makes a push fit in the inner front cylinder. The adaptor is tapered forwardly to its pointed front end which fits into the elastic cord when in its rest condition. The
30 cord is then pushed or rolled by hand along the adaptor on to the inner front

cylinder by the user, usually the surgeon. Difficulties arise because the elastic cord is small and the user has to wear gloves as protection against infection. This is especially true when the user has to perform several consecutive ligations.

- 5 It is an aim of the invention to alleviate the above-mentioned difficulties.

Summary of the Invention

According to a first aspect of the invention there is provided a mounting
10 apparatus for mounting an endless cord which is expandable from a contracted condition to an expanded condition onto an end of a structure having a transverse dimension greater than that of the cord when in the contracted condition, the apparatus comprising a tapered adaptor for the cord to be propelled over onto the end of the structure having a forward smaller end for
15 location in the cord in its contracted condition and a rear larger end for juxtaposing with the end of the structure and an expander device movable relative to the adaptor to propel the cord over the adaptor onto the rear larger end thereof.

- 20 In an embodiment of the invention such as hereinafter to be described the rear larger end of the adaptor is an axial section of the adaptor.

In an embodiment of the invention such as hereinafter to be described the end of the structure and the rear larger end of the adaptor each have a generally
25 circular outer surface profile.

In an embodiment of the invention such as hereinafter to be described the adaptor and the expander device are adapted to mesh with one another to propel the cord over the adaptor to the rear larger end thereof.

In an embodiment of the invention such as hereinafter to be described the adaptor comprises a plurality of circumferentially spaced-apart fingers which extend from the rear larger end towards the forward smaller end and the expander device comprises a plurality of circumferentially spaced-apart arms insertable between the fingers of the adaptor. Preferably, the fingers and arms are equi-spaced on the adaptor and expander device.

In an embodiment of the invention such as hereinafter to be described the forward smaller end of the adaptor is presented by a central member. Where the adaptor has circumferentially spaced-apart fingers, the fingers and central member may be connected to one another.

The adaptor of the mounting apparatus of the invention may be made from a plastics material such as polypropylene, for instance by injection moulding. Where the adaptor has the central member, however, the central member may be made from metal instead.

In an embodiment of the invention such as hereinafter to be described the expander device is operable in a first mode to propel the cord over the adaptor onto the rear larger end thereof and in a second mode to propel the cord from the rear larger end onto the end of the structure. To this end, the expander device may comprise a tubular section adapted to slide over the adaptor to propel the cord from the rear larger end onto the end of the structure.

In another embodiment of the invention such as hereinafter to be described the expander device is operable in a single mode to propel the cord over the adaptor onto the end of the structure.

In an embodiment of the invention such as hereinafter to be described the expander device takes the form of a hook device which comprises two opposed

hooks dimensioned to engage the cord when in its contracted condition, the hook device being adapted for the hooks to engage with the cord when in its contracted condition and to be displaced away from one another when the hook device is moved relative to the adaptor to propel the cord over the adaptor to the rear larger
5 end thereof.

In an embodiment of the invention such as hereinafter to be described the hooks are located at the ends of opposed arms made of a resilient material such as metal wire, preferably spring metal wire.

10

In an embodiment of the invention such as hereinafter to be described the hook device includes a crease for enabling the hooks to be brought close together for engagement with the cord when in its contracted condition. The hook device may include a further crease for enabling the adaptor to be moved into position
15 adjacent the hooks.

As with the adaptor, the expander device may be made from a plastics material such as polypropylene, for instance by injection moulding.

20 The mounting apparatus of the invention is particularly, although not exclusively, suited for mounting an elastic cord onto an end of a surgical instrument for ligating internal body tissue, for example the inner front cylinder of a surgical instrument of the type defined.

25 According to a second aspect of the invention there is provided a surgical kit comprising a mounting apparatus according to the first aspect of the invention. The surgical kit may further comprise a surgical instrument for ligating internal body tissue, for example a surgical instrument of the type defined.

30 According to a third aspect of the invention there is provided a method of

mounting an endless cord which is expandable from a contracted condition to an expanded condition onto an end of a structure having a transverse dimension greater than that of the cord in its contracted condition comprising the steps of providing a tapered adaptor having a forward smaller end and a rear larger end, 5 propelling the cord over the tapered adaptor onto the rear larger end thereof by displacement of an expander device relative to the adaptor and, when the rear larger end of the tapered adaptor is juxtaposed to the end of the structure, propelling the cord from the rear larger end of the adaptor onto the end of the structure.

10

In an embodiment of the invention according to its third aspect such as hereinafter to be described displacing the expander device relative to the adaptor propels the cord over the adaptor onto the end of the structure. As an example, this may be achieved by using an expander device in the form of a hook device which 15 comprises two hooks dimensioned to engage with the cord when in its contracted condition, engaging the hooks with the cord when the cord is in its contracted condition, displacing the hook device relative to the adaptor so as to propel the cord over the adaptor onto the end of the structure and disengaging the hooks from the cord.

20

Exemplary embodiments of the invention will now be described with reference to the accompanying Figures of drawings.

Brief Description of the Accompanying Figures of Drawings

25

Figure 1 is a side elevation, partly in section, of a surgical instrument of the type defined in a rest position,

30

Figure 2 is side elevation, partly in section, of the surgical instrument of Figure 1 in an actuated position,

Figure 3 is an enlarged sectional view along the line III-III in Figure 1,

Figure 4 is an enlarged sectional view along the line IV-IV in Figure 1,

5

Figure 5 is a side elevation of an adaptor of a mounting apparatus according to a first embodiment of the invention,

Figure 6 is a front view of the adaptor of Figure 5,

10

Figure 7 is a rear view of the adaptor of Figure 5,

Figure 8 is a perspective view of the adaptor of Figure 5,

15 Figure 9 is a side elevation of an expander device of the mounting apparatus according to the first embodiment of the invention,

Figure 10 is a front view of the expander device of Figure 9,

20 Figure 11 is a rear view of the expander device of Figure 9,

Figure 12 is a perspective view of the expander device of Figure 9,

Figure 13 is a side elevation of the adaptor of Figure 5 supporting an elastic cord
25 and the expander device of Figure 9 in a first mode of operation for propelling the cord along the adaptor,

Figure 14 is a side elevation corresponding to Figure 13 with the expander device in its first mode of operation located on the adaptor and the elastic cord having
30 been propelled by the expander device onto a rear cylindrical section of the

adaptor,

Figure 15 is a perspective view of the expander device of Figure 9 in its first mode of operation located on the adaptor of Figure 5,

5

Figure 16 is a side elevation of the adaptor of Figure 5 with the cord supported on the rear cylindrical section thereof and the expander device of Figure 9 in a second mode of operation for pushing the cord off the rear cylindrical section,

10 Figure 17 is a side elevation corresponding to Figure 16 with the expander device in its second mode of operation located on the adaptor and the elastic cord having been pushed to the rear edge of the rear cylindrical section of the adaptor,

15 Figure 18 is a side elevation of the expander device of Figure 9 (in cross-section) in its second mode of operation located on the adaptor of Figure 5 with the elastic cord having been pushed off the rear cylindrical section of the adaptor,

Figure 19 is a side elevation of an adaptor of a mounting apparatus according to a second embodiment of the invention,

20

Figure 20 is a side elevation of an expander device of the mounting apparatus according to the second embodiment of the invention which is in the form of a first hook device,

25 Figure 21 is a side elevation of another expander device of the mounting apparatus according to the second embodiment of the invention which is in the form of a second hook device,

30 Figure 22 is a perspective view of the second hook device when folded along a first crease, and

Figure 23 is a perspective view of the second hook device when folded along a second crease.

5 Detailed Description of the Exemplary Embodiments

In Figures 1 to 4 there is shown a surgical instrument for the ligation of haemorrhoids in a patient having an angled tube (4) which is connected at its front end to an inner front cylinder (1) having an inner volume dimensioned to
10 receive a located haemorrhoid (12).

As shown in Figures 3 and 4, the angled tube (4) is divided longitudinally by a partition wall (9) into a first part (7) and a second part (8). The first part (7) of the tube is adapted to be connected to a vacuum source at its rear end. A restriction
15 hole (10) is situated in the upper side of the tube (4) in a position that is convenient to reach by an operator's finger or thumb when the operator's hand grips a rear part of the angled tube (4). The size of the hole (10) is such that it is capable of being covered by the finger or thumb of the operator.

20 Figure 1 shows the surgical instrument in a rest position in which an outer discharge cylinder (3) is displaceably mounted on the inner front cylinder (1) in a rearward rest position relative to the inner front cylinder (1) and an elastic cord (2) is stretched around the front part of the inner front cylinder (1). The discharge cylinder (3) is connected to one end of a strip (5) which extends rearwardly in the
25 second part (8) of the tube from the outer discharge cylinder (3) to the rear part of the tube (4) where it is secured, passing out of a forward guiding hole (11) positioned in the lower side of the rear part of the angled tube (4) and back into the tube (4) through a rear guiding hole (13) longitudinally spaced from the forward guiding hole (11) to form an actuating
30 loop (6) outside of the tube (4) the purpose of which will become clear hereinafter.

In operation, the rear end of the first part (7) of the tube (4) is connected to a vacuum source and the forward part of the tube (4) is inserted into the anal cavity of the patient's body. The restriction hole (10) is covered by the operator's finger or thumb to create a vacuum in the inner front cylinder (1) whereby the located
5 haemorrhoid (12) is sucked into the inner front cylinder (1). By means of the fingers of the operator's hand, the actuating loop (6) is pressed towards the tube (4) causing the strip (5) to push the outer discharge cylinder (3) forwardly on the inner front cylinder (1). As shown in Figure 2, the forward movement of the outer
10 discharge cylinder (3) on the inner front cylinder (1) pushes the elastic cord (2) off the inner front cylinder (1) onto the base of the haemorrhoid (12) to shut off the blood circulation thereto.

The restriction hole (10) is then opened to counterbalance the vacuum in the inner
15 front cylinder (1) whereupon the instrument is removed from the anal cavity of the patient and the discharge cylinder (3) displaced back to its rearward rest position by the strip (5) ready for another elastic cord (2) to be mounted on the front part of the inner front cylinder (1). To this end, a mounting apparatus in accordance with the present invention is provided for mounting the elastic cord
20 (2) on the front part of the inner front cylinder (1) of the surgical instrument so that a further ligation can be carried out.

There will now be described with reference to Figures 5 to 18 a mounting apparatus according to a first embodiment of the invention. Referring first to
25 Figures 5 to 8, the mounting apparatus according to the first embodiment includes an adaptor (14) which is attachable to the inner front cylinder (1). The adaptor (14) has a central rod (16) extending forwardly along the axis of a cylindrical body (18). The rear end of the rod (16) is connected to the cylindrical body (18) and the forward end of the rod (16) is sufficiently small to enter the elastic cord (2) when in
30 its rest or contracted condition. A mounting plug (20) extends rearwardly from

the cylindrical body (18) and is dimensioned so as to make a push fit in the inner front cylinder (1) of the surgical instrument in order to mount the adaptor on the inner front cylinder (1). When mounted on the inner front cylinder (1), the outer surface of the cylindrical body (18) of the adaptor (14) is flush with or slightly
5 larger in diameter than the outer surface of the inner front cylinder (1). Four equi-spaced fingers (22) are mounted at their rear ends to the circumference of the cylindrical body (18) and converge towards the central rod (16) such that the forward ends of the fingers (22) rest on the central rod (16) immediately behind the forward extremity thereof.

10

The adaptor (14) may be made of any suitable plastics material such as polyvinyl chloride or the thermoplastic material polypropylene, for example by injection moulding. Alternatively, the central rod (16) may be made of any suitable metal with the rest of the adaptor (14) being formed from a plastics material.

15

As shown in Figures 9 to 12, the mounting apparatus according to the first embodiment further comprises an expander device (24) having four equi-spaced arms (26) mounted at their rear ends to the circumference of the forward end of a tube (28). The arms (26) converge from the circumference of the tube (28) so that
20 their forward ends (30) are spaced apart at a distance equal to or slightly greater than the diameter of the central rod (16) of the adaptor (14). The tube (28) is dimensioned so as to make an easy sliding fit on the cylindrical body (18) of the adaptor (14).

25 The expander device (24) may be made of any suitable plastics material such as polyvinyl chloride or the thermoplastic material polypropylene, for example by injection moulding.

In operation of the mounting apparatus according to the first embodiment, the
30 adaptor (14) is attached to the inner front cylinder (1) of the surgical instrument

and the elastic cord (2) placed on the tip of the central rod (16) as previously described. As will be understood by reference to Figures 13 to 15, the expander device (24) is manoeuvred to locate the forward ends (30) of the arms (26) of the expander device (24) around the central rod (16) of the adaptor (14) in the spaces
5 between the fingers (22). The expander device (24) is then pushed into the adaptor (14) so that the arms (26) and fingers (22) mesh with one another thereby causing the arms (26) to push the elastic cord (2) along the fingers (22) and onto the forward part of the cylindrical body (18) of the adaptor (14). As shown in Figure 14, when the elastic cord (2) has reached this position the forward ends (30) of the
10 arms (26) come into contact with a front face (32) of the cylindrical body (18) thereby preventing further movement of the arms (26) into the adaptor (14).

As will be understood by reference to Figures 16 to 18, the expander device (24) is then withdrawn from the adaptor (14), turned around and the tube (28) slid over
15 the cylindrical body (18) of the adaptor (14) to push the elastic cord (2) from the cylindrical body (18) onto the inner front cylinder (1) of the surgical instrument. The adaptor (14) and expander device (24) are then removed from the inner front cylinder (1) leaving the surgical instrument ready for ligating another haemorrhoid.

20

It is envisaged that the adaptor (14) and the expander device (24) may be designed so that the above-mentioned first movement of the expander device (24) onto the adaptor (14) will locate the elastic cord (2) on the inner front cylinder (1) of the surgical instrument thus avoiding the need to withdraw and reverse the expander
25 device (24) onto the adaptor (14).

The expander device (24) may be provided with a surface structure which gives good purchase of the expander device (24). As non-limiting examples, there may be mentioned texturing or roughening of the surface or the provision of an
30 annular flange on the surface.

In Figures 19 to 23 there is shown a mounting apparatus according to a second embodiment of the invention. As shown in Figure 19, the mounting apparatus according to the second embodiment includes an adaptor (114) having a forward tapered portion (122) and a rearward mounting plug (120) dimensioned to make a push fit in the inner front cylinder (1). The tapered portion (122) has a pointed front end (116) which is sufficiently small to enter the elastic cord (2) when in its rest condition and a rear end (118) which is dimensioned to be flush with or slightly larger than the outer surface of the inner front cylinder (1) when the adaptor (114) is secured thereto. The adaptor (114) is made of any suitable plastics material such as polyvinyl chloride or the thermoplastic material polypropylene.

Referring to Figure 20, the mounting apparatus according to the second embodiment further comprises a first hook device (124) made of resilient wire and having two opposed arms (132) which are joined by a bowed connecting portion (134). At the end of each arm (132) a hook (136) is provided. The hooks (136) are sufficiently small that they can both enter the elastic cord (2) when in its rest condition, and these hooks (136) are blunted to avoid tearing the surgeon's gloves and clothing or damaging the elastic cord (2).

When the first hook device (124) is in its rest position the arms (132) are spaced apart as illustrated in Figure 20. In operation of the mounting apparatus of the second embodiment, the arms (132) are initially pressed towards one another to enable the hooks (136) to be hooked through the elastic cord (2) and then released to enable the resilience of the connecting portion (134) to move the hooks (136) apart to expand the elastic cord (2) sufficiently to be mounted on the forward tip (116) of the adaptor (114) which has been, or will be, secured to the inner front cylinder (1). The first hook device (124) is then moved rearwardly with respect to the adaptor (114). The rearward movement of the first hook device (124) relative to the adaptor (114) causes the arms (132) to be progressively expanded outwardly

back towards their rest position whereby the hooks (136) and hence the elastic cord (2) are concomitantly expanded outwardly. As a result, the cord (2) is drawn over the adaptor (114) onto the forward part of the inner front cylinder (1) by the first hook device (124). The hooks (136) are then removed from the stretched cord (2) and the adaptor (114) removed from the inner front cylinder (1) leaving the instrument ready-for-use.

Referring to Figures 21 to 23, in place of the first hook device (124) there may be used a second hook device (224) made through injection moulding of a plastics material such as for example polypropylene. The second hook device (224) has two arms (232) joined by a connecting portion (234) with a hook (236) being formed at the end of each arm (232).

A first crease or hinge line (238) extends longitudinally along the centre of the connecting portion (234) and a second crease or hinge line (239) extends laterally across the rear of the two arms (232).

Folding the second hook device (224) along its first crease (238) brings together the two arms (232) and hooks (236) to enable the hooks (236) to be hooked into the elastic cord (2) when in its rest condition. The first crease (238) is then opened out to cause the arms (232) and the hooks (236) to move apart and thereby stretch the elastic cord (2). The second hook device (224) is then folded or hinged along its second crease (239) to enable the adaptor (114) to pass over a recessed part (240) of the connecting portion (234) as the second hook device (224) is moved rearwardly with respect to the adaptor (114) to pull the elastic cord (2) over the adaptor (114) and onto the inner front cylinder (1). As the second hook device (224) is moved rearwardly with respect to the adaptor (114) the arms (232) move outwardly to expand the elastic cord (2) progressively as it is pulled over the adaptor (114) and onto the inner front cylinder (1). After the elastic cord (2) is placed on the inner front cylinder (1) the hooks (236) are released from the elastic cord (2) leaving the

instrument ready-for-use.

Guide tracks may be provided to extend longitudinally along the adaptor (114) to guide the hooks (136; 236) of the first and second hook devices (124; 224) when
5 mounting the elastic cord (2) on the inner front cylinder (1). Such tracks may be diametrically opposed on the adaptor (114).

The mounting apparatus described hereinabove with reference to the accompanying Figures of drawings reduces the problems encountered when an
10 operator of the surgical instrument has to manipulate the elastic cord with a gloved hand.

It will be understood that the present invention has been described in relation to exemplary embodiments and can be modified in many different ways within the
15 scope of the invention as defined by the appended claims. Finally, it should be noted that the reference numerals in the appended claims are solely for guidance and not to be construed as having a limiting effect on the claims.

CLAIMS

1. A mounting apparatus for mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1) of a structure having a transverse dimension greater than that of the cord when in the contracted condition, said apparatus comprising a tapered adaptor (14; 114) for the cord to be propelled over onto the end of the structure having a forward smaller end (16; 116) for location in the cord in its contracted condition and a rear larger end (18; 118) for juxtaposing with the end of the structure characterised in that said apparatus further comprises an expander device (24; 124; 224) movable relative to the adaptor to propel the cord over the adaptor onto the rear larger end thereof.
2. A mounting apparatus as claimed in claim 1, characterised in that the expander device (24) is operable in a first mode thereof to propel the cord (2) over the adaptor (14) on to the rear larger end (18) thereof and in a second mode thereof to propel the cord from the rear larger end onto the end (1) of the structure.
3. A mounting apparatus as claimed in claim 1 or claim 2, characterised in that the adaptor (14) and the expander device (24) are adapted to mesh with one another to propel the cord (2) over the adaptor to the rear larger end (18) thereof.
4. A mounting apparatus as claimed in claim 3, characterised in that the adaptor (14) comprises a plurality of circumferentially spaced-apart fingers (22) which extend from the rear larger end (18) towards the forward smaller end (16) and the expander device (24) comprises a plurality of circumferentially spaced-apart arms (26) insertable between the fingers of the adaptor.

5. A mounting apparatus as claimed in any one of claims 1 to 4, characterised in that the forward smaller end of the adaptor (14) is presented by a central member (16).

5 6. A mounting apparatus as claimed in claim 5 when appendant on claim 4, characterised in that the central member (16) and the fingers (22) of the adaptor (14) are connected to one another.

7. A mounting apparatus as claimed in claim 2 or any one of claims 3 to 6
10 when appendant on claim 2, characterised in that the expander device (24) includes a tubular section (28) adapted to slide over the adaptor (14) to propel the cord (2) from the rear larger end (18) thereof onto the end (1) of the structure.

8. A mounting apparatus as claimed in claim 1, characterised in that the
15 expander device is in the form of a hook device (124; 224) which comprises two opposed hooks (136; 236) dimensioned to engage the cord (2) when in its contracted condition, the hook device being adapted for the hooks to engage with the cord when in its contracted condition and to be displaced away from one another when the hook device is moved relative to the adaptor (114) to propel the
20 cord over the adaptor to the rear larger end (118) thereof.

9. A mounting apparatus as claimed in claim 8, characterised in that the hooks (136; 236) are located at the end of opposed arms (132; 232) made of a resilient material.

25 10. A mounting apparatus as claimed in claim 8 or 9, characterised in that the hook device (224) includes a crease (238) for enabling the hooks (236) to be brought close together for engagement with the cord (2) when in its contracted condition.

11. A mounting apparatus as claimed in claim 8, 9 or 10, characterised in that the adaptor (114) is provided with guide tracks for guiding the hooks (136; 236) when the hook device (124; 224) is moved relative to the adaptor to propel the cord (2) over the adaptor.

5

12. A mounting apparatus as claimed in any one of the preceding claims for mounting an elastic cord (2) onto an end of a surgical instrument for ligating internal body tissue.

10

13. A surgical kit comprising a mounting apparatus as claimed in any one of claims 1 to 12.

14. A surgical kit as claimed in claim 13 including a surgical instrument for ligating internal body tissue.

15

15. A method of mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1) of a structure having a transverse dimension greater than that of the cord in its contracted condition comprising the steps of providing a tapered adapter (14; 114) having a forward smaller end (16; 116) and a rear larger end (18; 118), propelling the cord over the tapered adaptor onto the rear larger end thereof by displacement of an expander device (24; 124; 224) relative to the adaptor and, when the rear larger end of the tapered adaptor is juxtaposed to the end of the structure, propelling the cord from the rear larger end of the adaptor onto the end of the structure.

25

16. A method as claimed in claim 15, characterised by displacing the expander device (124; 224) relative to the adaptor (114) to move the cord (2) over the adaptor onto the end (1) of the structure.

30

17. A method as claimed in claim 16, characterised by the provision of an

expander device in the form of a hook device (124; 224) comprising two hooks (136; 236) dimensioned to engage with the cord (2) when in its contracted condition, engaging the hooks with the cord when the cord is in its contracted condition, displacing the hook device relative to the adaptor (114) so as to propel
5 the cord over the adaptor onto the end (1) of the structure and disengaging the hooks from the cord.

18. A mounting apparatus for mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1)
10 of a structure having a transverse dimension greater than that of the cord when in the contracted condition substantially as herein described with reference to and illustrated by Figures 1 to 18 or Figures 1 to 4 and 19 to 23 of the accompanying drawings.

15 19. A method of mounting an endless cord (2) which is expandable from a contracted condition to an expanded condition onto an end (1) of a structure having a transverse dimension greater than that of the cord in its contracted condition substantially as herein described with reference to and illustrated by
Figures 1 to 18 or Figures 1 to 4 and 19 to 23 of the accompanying drawings.

1/6

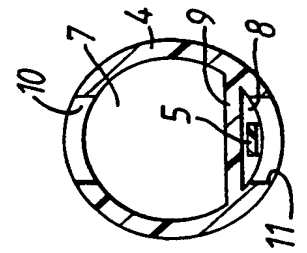
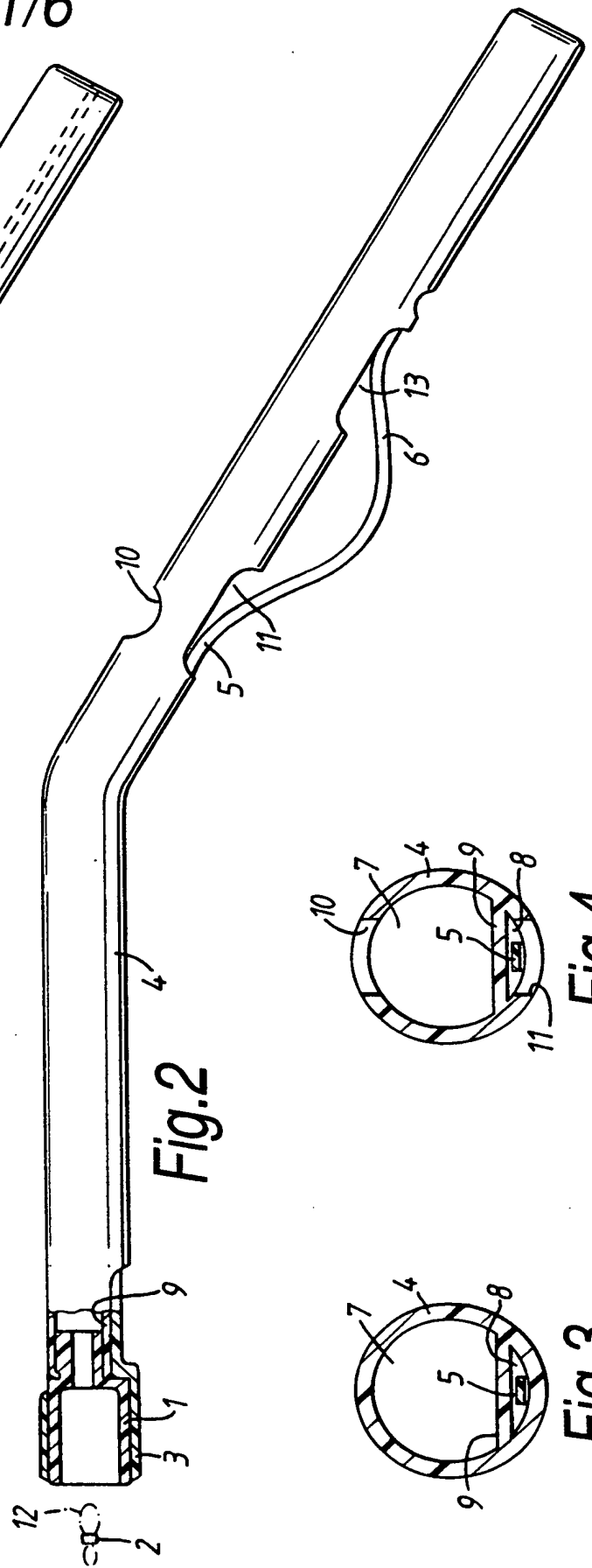
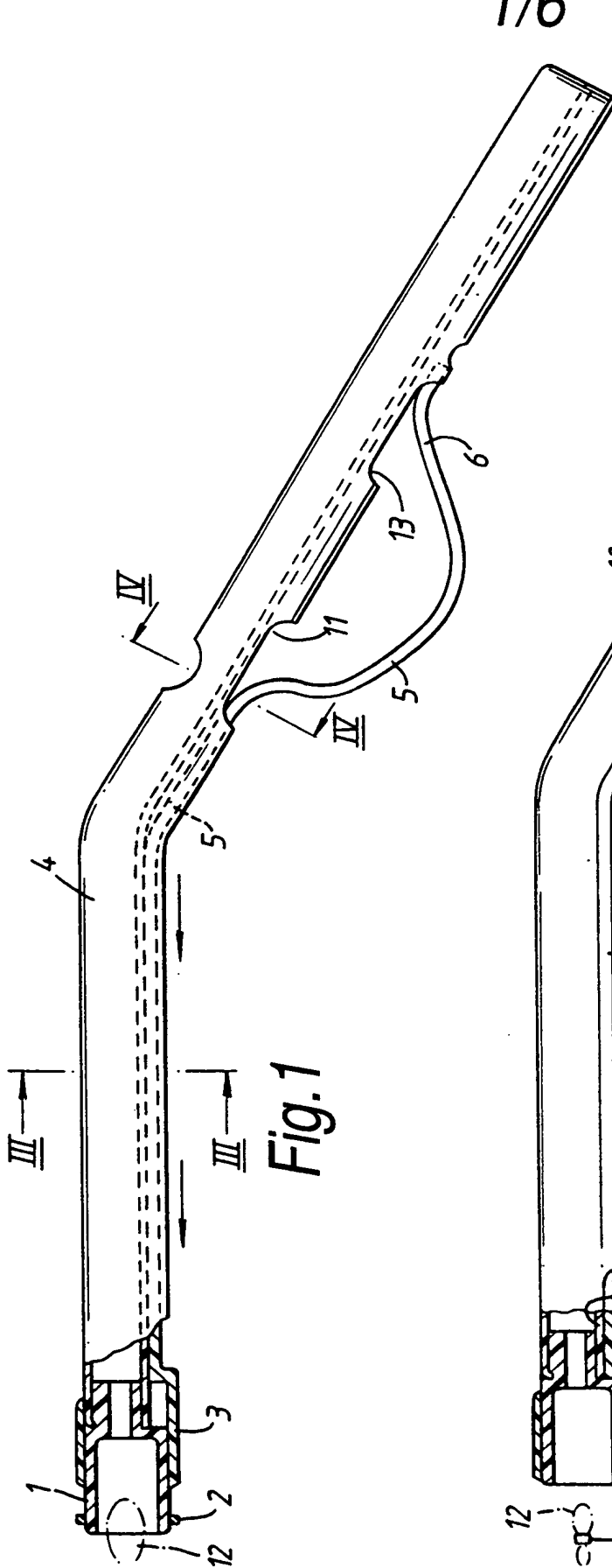
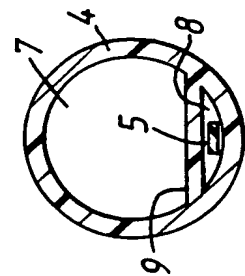


Fig. 4



2/6

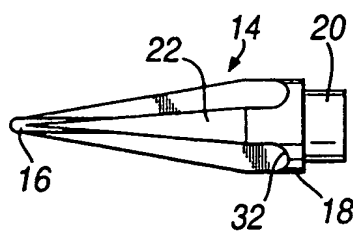


Fig. 5

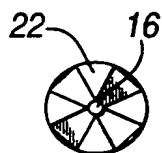


Fig. 6



Fig. 7

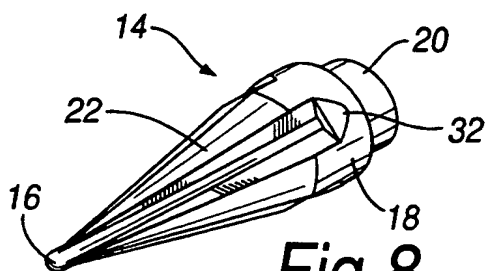


Fig. 8

3/6

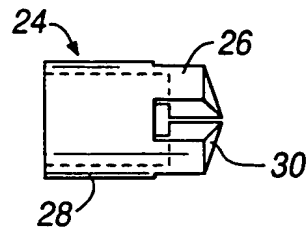


Fig. 9

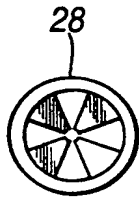


Fig. 11

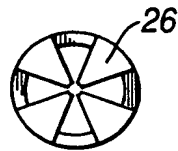


Fig. 10

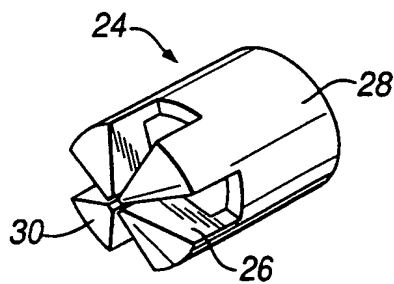
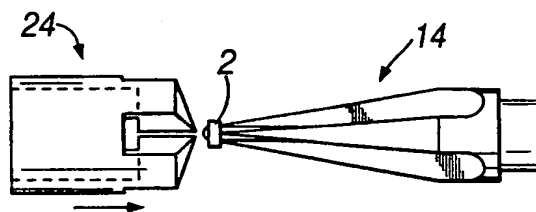
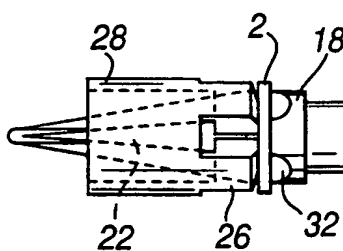
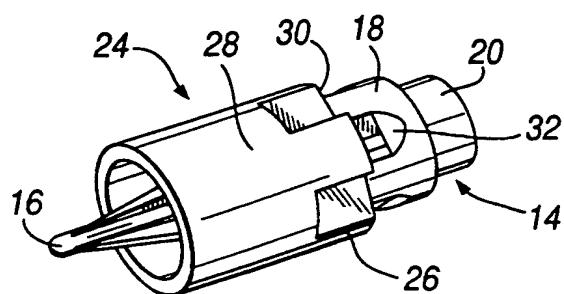


Fig. 12

4/6

*Fig. 13**Fig. 14**Fig. 15*

5/6

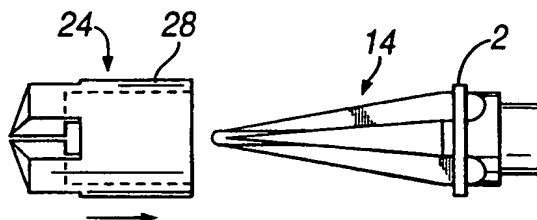


Fig. 16

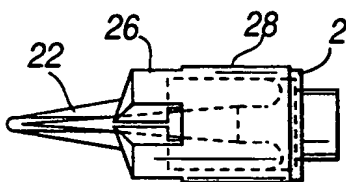


Fig. 17

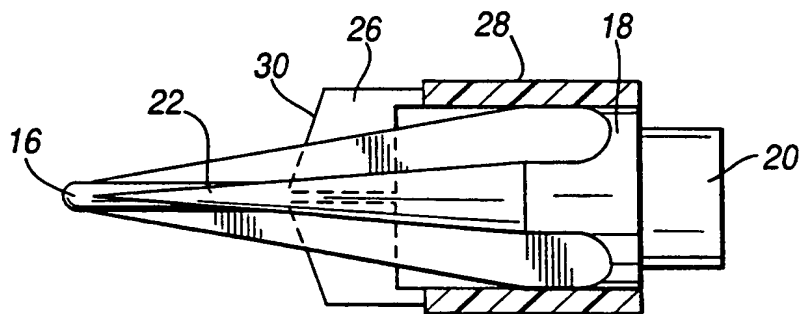


Fig. 18

6/6

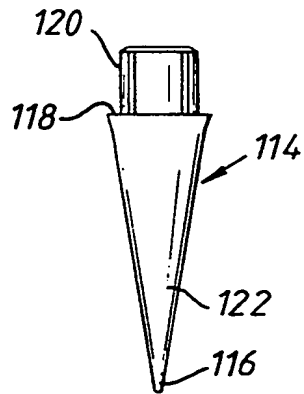


Fig. 19

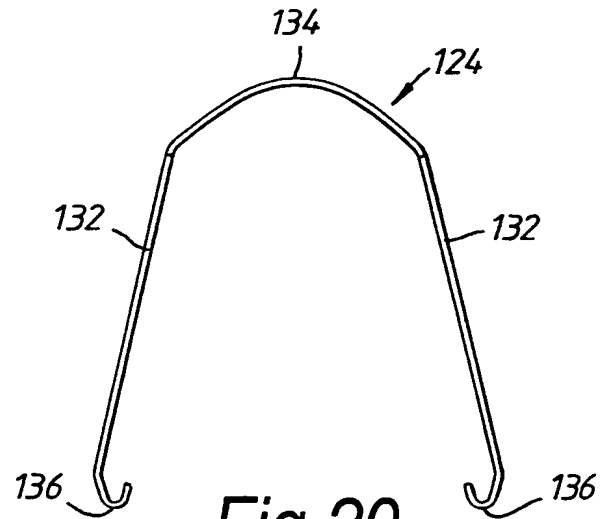


Fig. 20

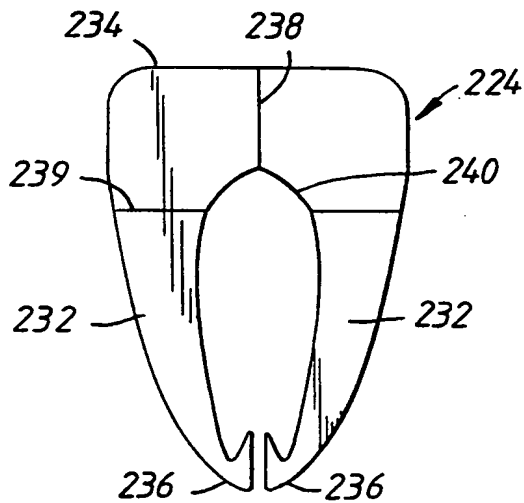


Fig. 21

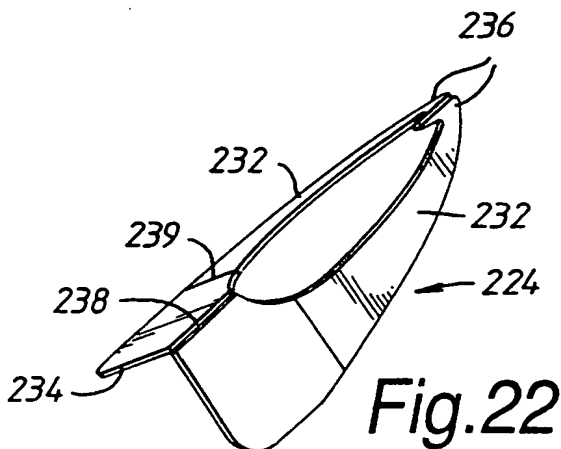


Fig. 22

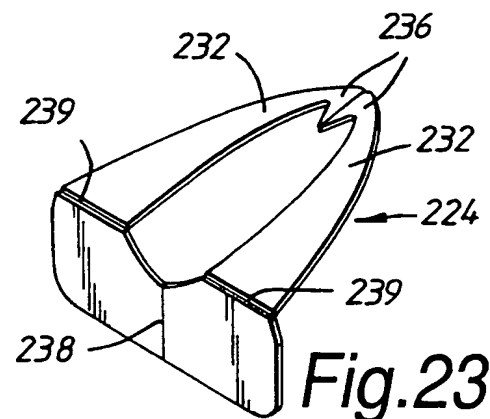


Fig. 23

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/01259

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61B 17/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 9205453 U1 (JUNGHANS, C.), 30 July 1992 (30.07.92), page 7, line 25 - page 8, figure 6	1-7,12-16, 18,19
A	--	8-11,17
X	US 4493319 A (T.J. POLK ET AL), 15 January 1985 (15.01.85), column 3, line 15 - line 63, figure 3	1-3,7,13-16, 18,19
A	--	4-6,8-12,17
X	US 4548201 A (I. YOON), 22 October 1985 (22.10.85), column 20, line 67 - column 12, line 39, figures 18-21	1-3,13-16, 18,19
A	--	4-6,8-12,17



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"F" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

13 December 1999

Date of mailing of the international search report

21-12-1999

Name and mailing address of the ISA

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Anette Hall / MR

Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/01259

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4794927 A (I. YOON), 3 January 1989 (03.01.89), column 11 - column 12, figures 18-21	1-3,7,13-16, 18,19
A	--	4-6,8-12,17
X	US 4860746 A (I. YOON), 29 August 1989 (29.08.89), column 3, line 21 - column 4, line 24, figures 6,9, 10	1-3,7,13-16, 18,19
A	-- -----	4-6,8-12,17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 99/01259

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: **13, 14**
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

see extra sheet

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

This application contains the following inventions or group of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1.

a) Claims 1-12: a surgical ring clip loader.

b) Claims 13-14: a surgical kit comprising a surgical ring clip loader.

.../...

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 9901259

Claim 13:

The features "A surgical kit comprising a mounting apparatus as claimed in any one of claims 1 to 12" are too general and elusive and are searched incompletely.

Claim 14:

The features "A surgical kit as claimed in claim 13 including a surgical instrument for ligating internal body tissue" are too general and elusive and are searched incompletely.

In the light of US, 4 493 319, A; US, 4 860 746, A; US, 4 548 201, A or DE, 9205453, U1 the subject matter of claim 1 lacks novelty.

Since the common concept represented by claim 1 is not new and there cannot be found a technical relationship involving corresponding special technical features, under Rule 13.2, between the subject-matter of claims 1-19, i.e. inventions a) to b), these inventions, a) to b) are not linked together by a single common inventive concept.

See also Box I.

INTERNATIONAL SEARCH REPORT
Information on patent family members

02/12/99

International application No.
PCT/SE 99/01259

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
DE	9205453	U1	30/07/92	NONE	
US	4493319	A	15/01/85	NONE	
US	4548201	A	22/10/85	US 4794927 A US 4860746 A	03/01/89 29/08/89
US	4794927	A	03/01/89	US 4548201 A US 4860746 A	22/10/85 29/08/89
US	4860746	A	29/08/89	US 4548201 A US 4794927 A	22/10/85 03/01/89